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Indian Standard

AUTOMOTIVE VEHICLES — AIR BRAKE SYSTEMS — PERFORMANCE REQUIREMENTS FOR BRAKE CHAMBERS

UDC 629·113-592·52 : 620·1

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 1992 **Price Group 2**

Automotive Braking Systems Sectional Committee, TED 4

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Braking Systems Sectional Committee had been approved by the Transport Engineering Division Council.

This standard is one in the series of Indian Standards being developed for air brake components. It is an adjunct to the IS 11852 series of standards specified for the performance requirements of braking systems for automotive vehicles.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 FEBRUARY 2009
TO
IS 13603 : 1992 AUTOMOTIVE VEHICLES — AIR BRAKE SYSTEMS — PERFORMANCE REQUIREMENTS FOR BRAKE CHAMBERS

(*Page* 1, *clause* 4.2) — Substitute the following for the existing:

'**4.2 Working Conditions**

Working medium	Air
Normal working pressure	Max system pressure of the vehicle
Maximum working pressure	25 percent more than Max system pressure of the vehicle
Thermal range of the operation	Normal – 10°C to 50°C Extreme – 40°C to 80°C'

(*Page* 1, *clause* 4.3) — Substitute the following for the existing:

'When the unit is subjected to a Max system pressure, the permissible leakage shall be less than 100 cc per minute.'

(*Page* 1, *clause* 4.5) — Substitute 'Max system pressure' *for* '8 bar'.

(*Page* 1, *clause* 4.5.2) — Substitute 'Max system pressure' *for* '8 bar'.

(*Page* 1, *clause* 4.6) — Substitute '−40°C' *for* '−25°C'.

(*Page* 1, *clause* 4.8) — Substitute '72 h' *for* '48 h'.

(TED 4)

Reprography Unit, BIS, New Delhi, India

Indian Standard

AUTOMOTIVE VEHICLES — AIR BRAKE SYSTEMS — PERFORMANCE REQUIREMENTS FOR BRAKE CHAMBERS

1 SCOPE

This standard covers the performance requirements, installation dimensions and tests for brake chambers used in air brake systems.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
9000 (Part 16) : 1983	Basic environmental testing procedures for electronic and electrical items: Part 16 Driving rain test
9844 : 1981	Methods of testing corrosion resistance of electroplated and anodized aluminium coating by neutral salt spray test

3 DIMENSIONS

The installation dimensions are shown in Fig. 1.

3.1 The manufacturer may also state the maximum chamber volume if so desired by the purchaser.

4 TESTS

4.1 The following tests shall be carried out on the specimen:

a) Leak test,
b) Output performance test,
c) Endurance test,
d) Low temperature test,
e) Dry heat test,
f) Salt spray test,
g) Over pressure test,
h) Water spray test,
j) Vibration test, and
k) Thread integrity test.

4.2 Working Conditions

Working medium	Air
Normal working pressure	8 bar
Maximum working pressure	10 bar
Thermal range of operation	Normal 10°C to 50°C Extreme − 25°C to 70°C

4.3 Leak Test

When the unit is subjected to a service pressure of 8 bar, the permissible leakage shall be less than 100 cc per minute.

4.4 Output Performance Test

The unit shall be subjected to assess output performance characteristics after the leak test. A high pressure of 8 bar and a low pressure of 2 bar shall be applied at different strokes and the output force is measured. The performance characteristics shall conform to Fig. 2. The permissible deviations in the values of output shall be agreed upon by the manufacturers and the purchasers.

4.5 Endurance Test

An endurance test comprises of a cycle test under the following conditions.

Total number of cycles	10^6
Distribution of cycle	6 × 0 to 2 bar 1 × 0 to 8 bar
Frequency	16 cycles/min

After endurance test, the maximum permissible leakage carried out as per **4.3** shall be 250 cc per minute.

4.5.1 The variation in performance after endurance test shall be with in ± 10% of initial value.

4.5.2 *Structural Integrity Test*

Number of cycles	10^6
Pressure	0 to 8 bar
Stroke	75 percent of maximum stroke

At the end of the test there shall be no permanent damage.

4.6 Low Temperature Test

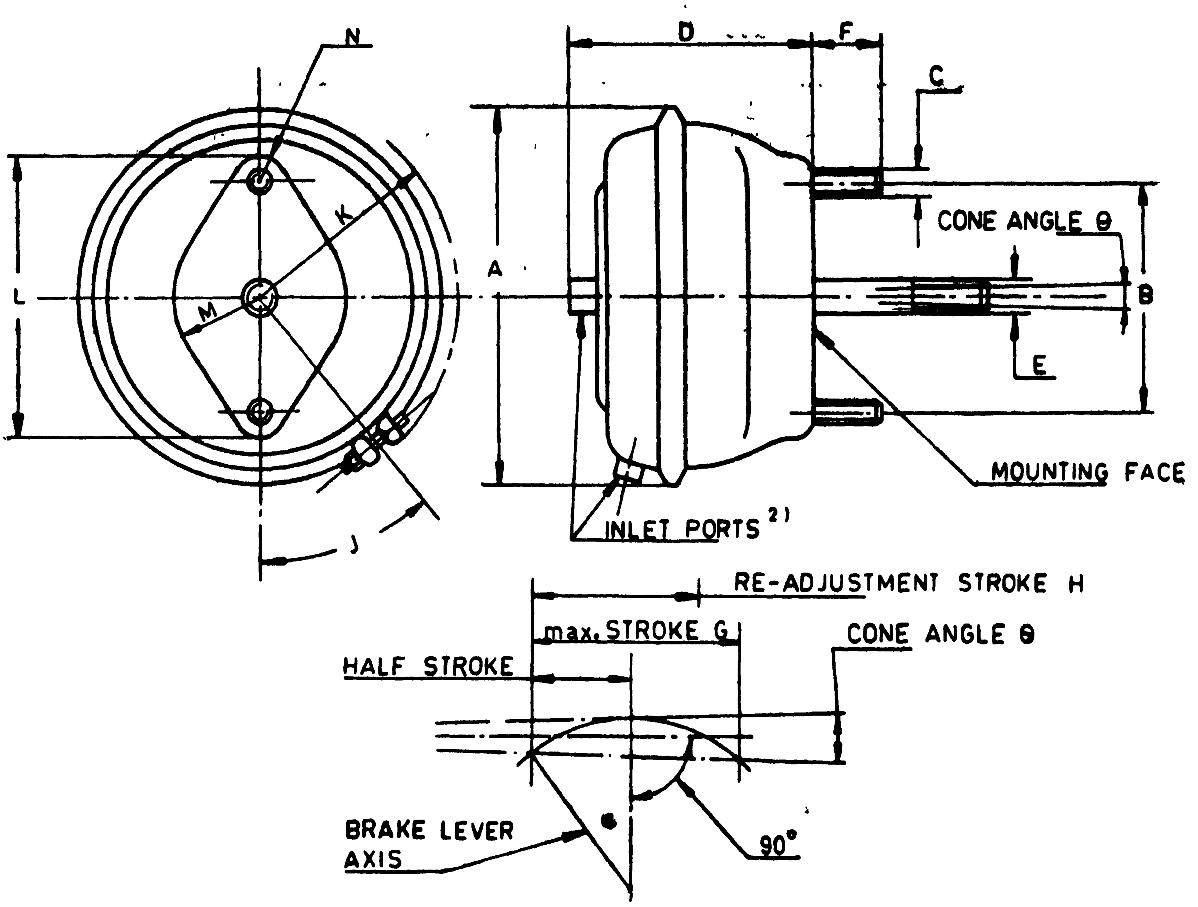
The unit shall comply with **4.3** and **4.4** after conditioning in a chamber for 16 h at a temperature of − 25°C.

4.7 Dry Heat Test

The unit shall comply with **4.3** and **4.4** after conditioning in a chamber at 70°C for 16 h.

4.8 Salt Spray Test

The components shall be subjected to a salt spray test for 48 h as per IS 9844 : 1981. At the



All dimensions in millimetres.

Type	A	B	C	D	E	F	G	H	J	K	L	M	N	θ
12	144·5	76·2	M12 × 1·5	110·3	M16 × 1·5	28·6	45	35	40°	89	110	32	19	2·5°
16	162·0	76·2	M12 × 1·5	127·8	M16 × 1·5	28·6	57	44	40°	95	114	36	19	2·0°
20	172·2	120·6	M16 × 1·5	115·1	M16 × 1·5	31·8	57	44	30°	103	145	48	19	
24	184·2	120·6	M16 × 1·5	115·1	M16 × 1·5	31·8	57	44	30°	108	156	48	21	
30	206·4	120·6	M16 × 1·5	140·4	M16 × 1·5	31·8	63·5	51	25°	119	162	52	21	
36	228·6	120·6	M16 × 5·1	167·5	M16 × 1·5	31·8	76	57	25°	132	168	56	24	1·5°

NOTES

1 *B*, *C*, *E*, *G*, *H* and θ are standard dimensions generally followed.

2 Additional optional port M14 × 1·5 standard, other threads optional.

3 Angular relationship between axis of brake chamber and brake lever shall be as per figure above to ensure minimum variation of effective brake lever length.

4 Principal dimensions may be rounded off to the next higher integer.

5 Maximum chamber volume shall be agreed between the purchaser and the supplier.

FIG. 1 TYPICAL BRAKE CHAMBER INSTALLATION DIMENSIONS

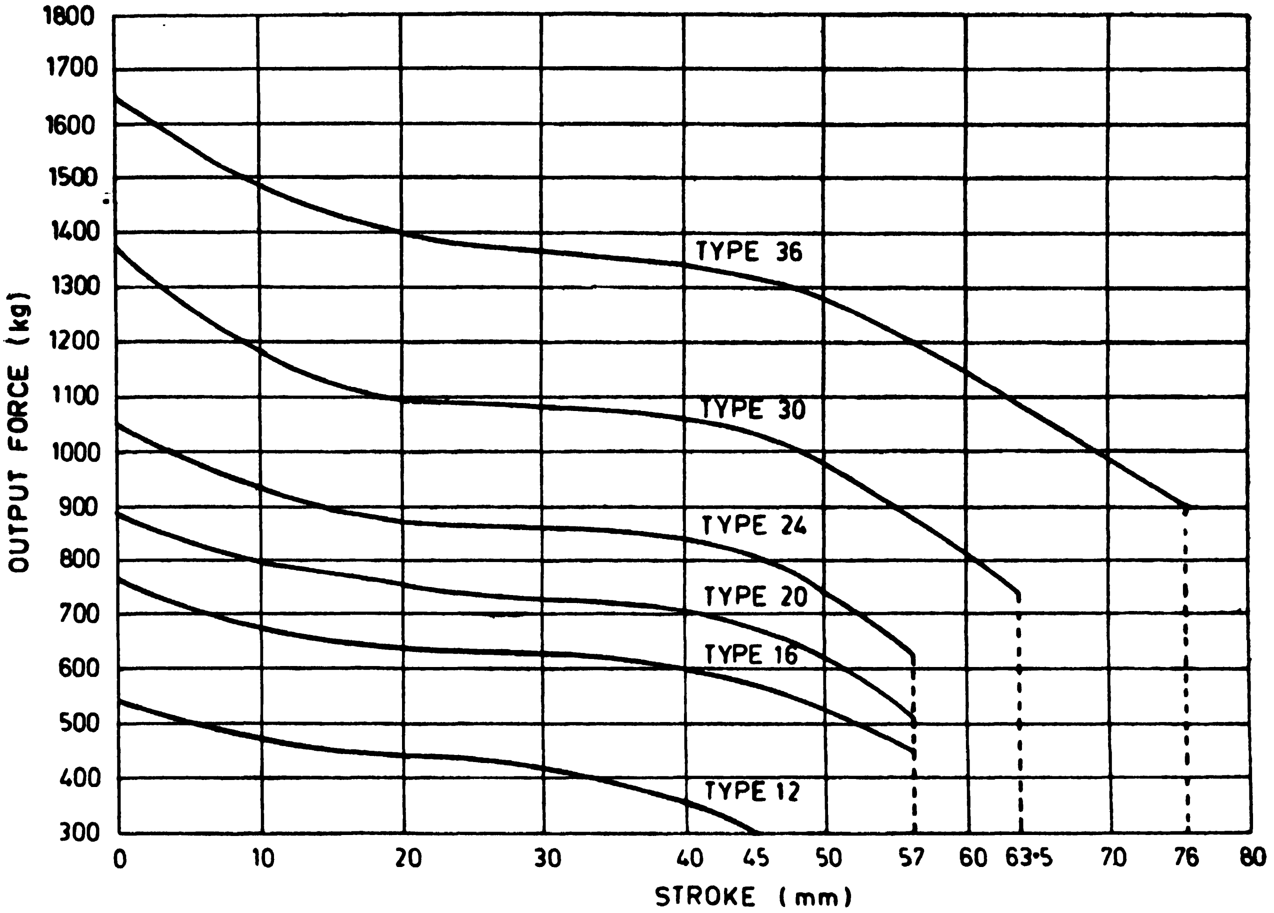


FIG. 2 TYPICAL OUTPUT *vs* STROKE CHARACTERISTICS

end of the test there shall not be any corrosion of parent material or of any component.

4.9 Over Pressure Test

The unit shall be subjected to air or hydraulic pressure of 16 bar for two minutes without suffering any damage.

4.10 Water Spray Test

The components shall be subjected to a driving rain test in accordance with IS 9000 (Part 16) : 1983. The components shall not reveal any defects (both internal and external).

4.11 Vibration Test

The unit shall be subjected to an acceleration of ±16 g at 50 Hz for 10^6 cycles. At the end of this test the unit shall pass tests as per **4.3** and **4.4**.

4.12 Thread Integrity Test

All threaded ports to be checked for thread strength integrity test by alternately tightening and loosening for 25 times with a specified torque.

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